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Midline Movement: The Positive Effects on Student Behavior in a Kindergarten Classroom

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Abstract

Educators are realizing the unrealistic expectations on students to be quiet and sit still for extended periods of their day (Donnelly & Lambourne, 2011). Some educational advocates have been reintroducing movement into the school day in response to research that indicates the importance of extracurricular activities on developing the whole child (Hannaford, 1995). Movement, connection, touch, play, and creative endeavors have been shown to be critical components to teaching students to be well-rounded individuals (Hannaford, 1995). This study explores how movements and activities that cross the midline affect a student's focus and ability to learn in the classroom. Cultivating an understanding of the importance of midline movements in the classroom is important to create buy-in for schools and teachers to join this movement. In turn, students will then reap the benefits that midline movements can provide for them.

The purpose of this study was to create awareness and open up a larger conversation about the benefit to students from midline movements which has not yet been studied in education research up to this point. The researcher conducted longitudinal qualitative research with a phenomenological approach and from a pragmatic worldview in a kindergarten classroom at an elementary school in northern California. The study focused on how different students felt in their body following the completion of midline movements compared to times following when they did not engage in the midline movements. The findings suggest a correlation between completing midline movements and a student's positive behavior in the classroom through a gained sense of self-awareness, body awareness, and situational awareness. Students feel a calmness over themselves which effects their noise level, ability to sit still, overall cleanliness of the classroom, and their teacher's ability to feel calm as well. The connection between the mind

and the body is an essential part of education and needs to be on the forefront of how we educate our students.

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Chapter 1: Introduction

Education is described as an enlightening experience as well as the process of receiving and providing systematic instruction. In our society, students are required to receive an education. However, not all students receive the same education or are equally equipped and able to take in and learn from the education they are given. Many schools' main focus is on teaching students how to read and do math, thereby neglecting the idea of teaching the whole child. Children, especially in a kindergarten classroom, are not robots who exclusively need to learn the academic skills such as how to read and complete math problems to be successful in life. The children need to be shown life skills and learn how to be an embodied student so they can be successful in their academic careers and in life. To educate the whole child, we must take a step back and see how we not only teach their mind but also their body as well. Training both their body and mind to work together as one is how students will be successful and grow as strong and capable members of society. Every child is born with a midline barrier, which hinders their ability to track with their eyes across the midline of their body (Biles, 2007). As children grow older, with normally physical activities, this barrier diminishes (Biles, 2007). However, this is not the case for all children. The midline barrier causes students problems and makes school and learning much more challenging than it should be, causing them to fall behind. Midline movements are movements that cross over an individual's midline. This study will look at how such movements affect students and the benefits of teaching not only the core subject areas but also teaching to the whole child.

Statement of Purpose

The purpose of this study was to explore the effects of midline movements on students and their behaviors in the classroom. Additionally, this study sought to learn from students how

completing midline movements made them feel in their bodies. A review of literature revealed that midline movements promote neurological repatterning and facilitate whole-brain learning (Hyatt, 2007). Three midlines have been identified and exercises that enhance these midlines have shown to improve reading, writing, listening, comprehension, and balancing of emotion skills (Hyatt, 2007). Although simple tasks can be administered when the midline and both hemispheres of the brain are not fully developed, it has been found that more complex tasks can be performed more effectively when both hemispheres are working together and the midline has been fully developed (Shillcock & McDonald, 2005).

Little research has been done to directly look at how midline movements completed inside the classroom affect kindergarten students and how they feel in their bodies, their ability to focus and learn throughout the day, and their overall behavior following midline movement activities in the morning. Therefore, more data is needed to better comprehend students' behaviors following midline movements and their thoughts on how it affects them. This research looked to answer how students felt in their bodies after completing midline movement activities, how completing these activities in the morning affected student behaviors throughout the day, and how these movements affected a student's ability to focus and learn in the classroom.

Overview of Research Design

The research engaged in sequenced and longitudinal qualitative data collection with a phenomenological approach and from a pragmatic worldview. The researcher conducted a study using a longitudinal qualitative approach to look at how midline exercises affect how a student feels and behaves in the classroom following such movements. Student data was collected from twenty-three kindergarten students from the researcher's class at River Elementary School, in Petaluma, California (school and student names in this thesis are pseudonyms). Participants in

this student study were all minors, aged five to six. River Elementary School is where the researcher is currently a classroom teacher and had pre-existing relationships with the student participants as their primary classroom instructor. In addition, three professional educators at Valley Elementary School were recruited to participate in individual interviews. These educators included: the founder of the Integrated Perceptual Motor Program (IPM), the principal who brought the program to Valley Elementary School, and a classroom teacher at that school site who piloted the program and associated equipment. Valley Elementary School is where the participant did her student teaching and is in the same small school district. Due to this, the researcher had a pre-existing relationship with the professional educators participating in the interviews.

Data was collected by written responses from the students and in-person interviews from the professional educators. Student participants experienced a sequence of alternating days in which they participated in documented movement activities and days in which they did not. This went on for a total of three rounds alternating between days in which students participated in the movement activities and days in which students did not participate in the movement activities. On the days in which they participated in the movement activities, they went through a series of movements that focused on enhancing their midline for approximately five to ten minutes. Following the movements, or on control days after they had proceeded with other standard (non-movement focused) school activities, students were asked to write a sentence and draw a picture describing how they feel in their bodies. Professional educators who participated in the interviews were asked various questions about midline movements and the IPM program they use at their school site.

The researcher is a professional educator who has built rapport and community with the students and professional teachers participating in the study. During the process of conducting the study, the researcher worked to remove all personal bias, to the extent possible. As a former division-one athlete, the researcher believes that physical education and movement can benefit students, not only in their physical abilities but also in other aspects of their lives. Due to the researcher's significant bias towards physical education and movement, the potential consequences could have been, that during the process of coding, the researcher could have made judgements about the students' experiences and beliefs that weren't true to the intention communicated by the student or teacher, and by doing so misinterpreted the results of the research. However, recognizing her bias and drawing attention to her positionality to the participants helped to increase the validity of the findings.

Significance of the Study

Incorporating midline movements into an elementary school classroom routine helps students to feel calm in their bodies which leads to positive student behaviors throughout the day. Eighty-six percent of students use calming words to describe how they are feeling in their bodies following the completion of midline movements. The theme that was consistent throughout interviews with educational professionals and student writing entries and behaviors was how movements directed at a student's midline can help them to feel calm in their bodies and show behaviors that both support and exhibit this calm feeling in the classroom. The findings of this study showed a positive effect on the self-awareness, body awareness, and overall situational awareness of students in the classroom and their surroundings.

Elementary school students completing midline movements are strengthening the connection between their mind and body which carries into other aspects of their education.

When students fuel their body they are in turn fueling their mind. When students are fueling their body with midline movements they feel calmer overall in their bodies which can be shown in other aspects of their day.

Research Implication

These findings speak to altering the cultural values and norms of society regarding physical education and the introduction of movements that cross over the midline. This study shows the importance of elementary school students completing midline movements to create more equity in the classroom for students. Not all students have access to gymnastics, tumbling, and other activities outside of school that will remove a student's midline barrier. Including these midline movements as part of the physical education curriculum and daily classroom practices in part addresses the social inequities that present in the form of bodies with barriers. This study will show the importance of physical education, and specifically midline movements, on a student's learning development. It could impact how curriculum and programs are designed at the district and even state levels. School districts specifically at the elementary school level might put more emphasis on implementing a comprehensive physical education program.

Chapter 2: Literature Review

This literature review seeks to understand and find ways in which movement and activities that cross the midline can benefit students' ability to be in control of their bodies and overall ability to learn. Educators are realizing the unrealistic expectations on students to be quiet and sit still for extended periods of their day (Donnelly & Lambourne, 2011). Overall, there is the opportunity for the education system to change from focusing on just small skills to teaching through lived experiences and movement by looking at the whole child (Hyatt, 2007).

This review looks specifically at kinesthetic movements and how they have been shown to benefit students inside the classroom with their physical, emotional, and social skills (Lengel, & Kuczala, 2010), as well as how the brain is connected to these physical movements. The literature also takes a closer look at the research on IPM, a program created by Dr. David Biles. The research discusses how the Vestibular Apparatus and Midline of each individual plays a large role in connecting the brain and the body together.

Kinesthetic Movement

Students are asked to focus for approximately six to eight hours per day on instruction while spending the majority of their day in the classroom and at school (Donnelly & Lambourne, 2011). According to Strean (2010), when listening to a lecture, one's attention will drop after approximately ten minutes. Alongside this research teachers are seeing an increase in the number of concentration deficits in students in their classrooms (Budde, Voelcker-Rehage, Pietraßyk-Kendziorra, Ribeiro, & Tidow, 2008). Students have limited attention spans and require help in learning how to self-regulate their moods (Lengel, & Kuczala, 2010). Studies have shown that

movement and music help students learn these important skills and be able to manage their brain and body both physically, mentally, and emotionally (Lengel, & Kuczala, 2010).

The Brain Embodied

Weslake and Christian (2015) state that, "the brain is a highly complicated organ that thrives on movement" (p. 38). Brain breaks are identified as a break from learning that is based on breathing or relaxation, vigorous physical activity, focused on mental activities, or a combination of the three (Donnelly & Lambourne, 2011 and Weslake, & Christian, 2015). Physical and mental activities can be used in the classroom as a tool for teachers to manage the attention of the class (Weslake, & Christian, 2015). Brain breaks have been shown to improve overall classroom behavior by increasing the amount of time students are on task and focusing on instruction (Donnelly & Lambourne, 2011). Movement has been shown to increase circulation as well as refocus attention and reduce stress levels of the children (Lengel, & Kuczala, 2010). However, Skoning (2008) brings up the fact that these quick movement activities between lessons do not actually connect with the curriculum in meaningful ways and questions their overall benefit to students.

Intelligence and Development

Kinesthetic learning activities are defined as an activity that physically engages students in the learning process (Begel, Garcia, & Wolfman, 2004). Skoning (2008) shows that using creative movement and dance in the classroom as a teaching tool can benefit a wide variety of students and that the idea of Multiple Intelligences was brought up in various articles and studies when discussing how kinesthetic learners can benefit from this style of teaching. Skoning also states that many students who are perceived to have behavioral problems or challenges in the

classroom are often students that are kinesthetic learners who are not able to fully understand the material through explicit teaching such as worksheets or listening to lectures. Students with learning disabilities or neurodevelopmental disorders (such as attention deficit hyperactivity disorder, developmental coordination disorder, and autism spectrum disorder) were also mentioned when discussing which students would benefit from this style of teaching (Skoning, 2008). According to a variety of studies, these activities need to challenge students appropriately both physically and socially for there to be any beneficial factor (Begel et al., 2004). Motor development is a central focus for teachers working with young children and students with learning disabilities or neurodevelopmental disorders (Hill, 2010). Hill (2010) discusses how the skill level in one domain has an impact, positively or negatively, on the development of another. For example, motor development also impacts other areas, such as a student's physical health, mental health, and cognitive achievement (Hill, 2010).

Literature suggests that physical activity can impact academic performance in a variety of direct and indirect ways (Raspberry et al., 2011). Studies showed that classroom physical activities affected cognitive skills such as a student's aptitude, self-control, attention, and memory (McClelland, Pitt, & Stein, 2015; Raspberry et al., 2011). They also showed an effect on a student's attitude or mood, academic behaviors such as being on-task or concentration levels, as well as their academic achievement on standardized testing or reading literacy scores (Raspberry et al., 2011). In one study, improvements in the intervention or exercise group showed improvements in visual tracking, which benefitted them in many aspects of their academic and everyday lives (Reynolds et al., 2003). The intervention group improved academically in their phonological skills, letter name fluency, reading fluency and nonsense word reading (Reynolds et al., 2003). This group also improved their postural stability, direct

balance, dexterity, and eye movement control (Reynolds et al., 2003). Reynolds et. al. (2003) believes that these skills and an increased acquisition of literacy will help an individual's development, happiness, and overall employment prospects as adults.

Studies suggest that students who engage in physical activities outside of school tend to perform better than other students academically in the classroom (Budde et al., 2008). Few school-aged children complete the recommended daily one hour of moderate to vigorous physical activity (Booth et al., 2014). According to state standards, students are required to spend two-hundred minutes of physical education every ten school days for students in grades one through six. In addition to all of the benefits to children described in this review, a student's health and well-being also benefited from physical exercise and movement (Booth et al., 2014). It was also determined that spending the recommended amount of time on physical education was not detrimental to academic attainment (Booth et al., 2014).

In recent years, it has become increasingly evident that physical exercise and motor development are closely related to physical health, mental health, and cognitive achievement (Hill, 2010). Various studies have now shown the importance of the first months of life and how closely related motor development is to language development (Hill, 2010). The Millennium Cohort Study showed how "delayed attainment of key motor milestones at nine months was significantly associated with poorer cognitive development at five years old" (Hill, 2010, p. 888).

Focus and Awareness

Physical activity can help to develop bodily awareness, which is a crucial skill for students to have in the classroom (McClelland et al., 2015). Students use these skills in the classroom to sit on the carpet, sit at a table, stand in a line, and walk throughout the room safely. Training the brain to control one's body can be done through tensing muscles (McClelland et al.,

2015). Physical movements can be done to train both the body and the brain to work together to improve self-control and mental focus in other unrelated cognitive tasks (McClelland et al., 2015; Donnelly & Lambourne, 2011). According to McClelland et al. (2015), through physical activities that incorporate visual and auditory tasks students are able to improve their attention, self-control and enhance their academic attainment.

Various physical movements have been tested to determine their benefits on student academic performance as well as their ability to focus and have self-control in the classroom. Coordinative exercise has shown to help with developing attention, working memory, verbal learning, and memory skills (Budde et al., 2008). According to studies, coordinative skills should be a main focus of physical activity to benefit students both inside and outside of the classroom (Budde et al., 2008). And, according to Best (2010), cognitively engaging exercise appears to have a stronger effect over non-engaging exercise. This means that physical activities that require students to use their brain and think have shown a greater effect on a student's academic performance than physical activities that are less structured. Group activities such as games, sports, etc. require complex cognition for students to be able to cooperate with others, anticipate behaviors of others, play strategically, and adapt to new or unforeseen situations (Best, 2010). Participating in group games and complex motor skills leads to a positive effect on retention, memory, and transfer of skills (Best, 2010).

Varieties of Somatic Movement

Depending on a student's age, students may benefit from a more or less structured form of exercise or game (Best, 2010). Students may benefit from less structured forms of exercise that involve more play as well due to the dwindling amount of recess students are receiving at school (Best, 2010). If a student is too young they may have trouble with activities that contain a

large amount of rules or instructions (Best, 2010). The opposite can be said about older students: if an activity is too simple or can be quickly mastered, a child or student might become disengaged or uninterested (Best, 2010).

According to Best (2010), executive function refers to the cognition processes needed for goal-directed cognition and behavior, and physical activities such as aerobic games and executive function tasks require similar ways of thinking as well as similar cognitive skills. Best (2010) further reports that executive function has been shown to help students to self-regulate their body and emotions through learning how to follow directions and control their attention, and discusses how student-centered classroom environments have been shown to positively impact a student's executive function when comparing it with a more traditional, teacher-centered classroom environment.

Physical activity enhances performance on tasks that involve quick decisions and automatic behaviors (Lambourne, & Tomporowski, 2010). Response speed and accuracy to various activities improved with acute exercise and moderate exercise was determined to improve cognitive performance such as reaction time (Kashihara, Maruyama, Murota, & Nakahara, 2009; Lambourne, & Tomporowski, 2010). Incorporating physical activities was shown to improve the speed of the mental process as well as improve the retrieval of memories and memory storage (Lambourne, & Tomporowski, 2010).

Mind and Body Connection

Focused awareness and mindfulness of these physical activities can be more beneficial to students than the aerobic impact these activities are giving to them as well (McClelland et al., 2015). Studies show that physical exercise can improve mood and psychological well-being, which in turn helps to reduce stress, anxiety, and depression (Kashihara et al., 2009).

The education system still largely regards the mind and body as two different and distinct entities (McClelland et al., 2015). Schools and educators are trained to focus their teaching on the student's mind, with no standards that incorporate or include their body in the classroom (McClelland et al., 2015). Most learning in schools happens explicitly: through reading, listening, and worksheets (Lengel, & Kuczala, 2010). However, the brain prefers to learn in an implicit way: through movement, emotions, and life experiences (Lengel, & Kuczala, 2010). The brain thrives on concrete examples, connects old experiences to new, needs social and environmental interactions, and needs choice or control over its experiences (Lengel, & Kuczala, 2010). Emotions help the brain remember experiences and in turn, students are more effective in retaining knowledge of what they have learned for years to come.

According to Johnson (2004), "the great ideas that have created the modern world have arisen from quietly sitting bodies, hunched over manuscripts, lecterns and desks, typewriters, and computers" (p. 6). He asks us, "What would happen to our ideas about things if we moved more, not randomly, not simply as isolated individuals, but as a conscious community of intellectuals inquiring into the results of deliberate movement practices for our thinking and writing?" (Johnson, 2004, p. 6). The possibilities are unknown up to this point as to what individuals can achieve by incorporating movement into their routines in the classroom or workplace.

Somatic History and Learning

The theoretical umbrella "somatics," a science which gained knowledge of the body through experimental studies gained acceptance in the field of movement (Johnson, 2004). Johnson (2004), states that somatics is "better understood in comparison with older Asian practices whose fundamental aim is the cultivation of adult behavior and capacity and only secondary the alleviation of specific ills" (p. 2). There are three schools of somatics: sensory

awareness, continuum, and authentic movement (Johnson, 2004). Elsa Gindler developed sensory awareness in Berlin during the early 1900s and brought it to America in the late 1930s through Speads and Selver (Johnson, 2004). Johnson (2004) states that the goal of sensory awareness is to "become increasingly more awake to the many aspects revealed in paying careful attention to repeated experiences of sitting, coming to standing, standing, and coming back to sitting" (p. 2). Whitehouse created the practice now popularly known as authentic movement or "moving in depth" (p. 3-4), which involves teaching people how to wait for movement to arise and evolve (Johnson, 2004). Concentration and patience help to allow the body to move in its own natural and genuine way (Johnson, 2004). Authentic movement allows for the immediate expression of how one is feeling (Johnson, 2004). Johnson (2002) discusses how physical education is often taught in formal ways geared towards performance instead of a natural expression that focuses on creativity and imagination.

The Learning Body

According to Strean (2011), "all learning occurs in a mood and part of fostering student engagement includes attending to and maintaining the mood of the classroom" (p. 189). To learn you must be in an environment that is calm, supportive, and stress free (Hannaford, 1995). Student-centered learning is a teaching approach in which students are in the center of the learning process and influence the content, activities, materials, and pace of learning (Collins & O'Brien, 2003). According to Johnson (2002), experimenting with student-centered learning has been done with the main idea that "pedagogy should be shaped and modified constantly by paying attention to what actually was happening among the students in response to teaching" (p. 3). Rogers said that teaching should be adjusted constantly based on the non-verbal facial expressions, postures, and gestures of students (Johnson, 2002). Awareness exercises, simple

body exercises, and breathing exercises are all ways in which you can alter the academic space to gain buy-in from your students (Johnson, 2002). An alternate way of thinking of student-centered learning is a "bottom up movement." Focusing, authentic movement, and body-mind centering are three illustrations of this "bottom up movement" (Johnson, 2006). Eugene Gendlin was the creator of the focusing method and according to Johnson (2006), "focusing typically involves two people sitting quietly, learning to pay attention to the ebbs and flows of experience, waiting for words to emerge that truly express those experiences" (p. 118). The turn toward experience and learning to wait attentively before speaking is a characteristic of not just this, but many practices (Johnson, 2006). The idea of this method is to slow down, pay attention, and savor silence while remaining nonverbal for a longer period of time, different from the normal amount of time devoted to talk, thought, and entertainment (Johnson, 2006). The school of body-mind centering was founded by Bonnie Bainbridge Cohen in 1993; body-mind centering is the idea of "learning with the body," not the brain (Johnson, 2006, p. 123). To learn with the body and mind together, one must be able to use practices such as breathing, touching, and sensing; and devoting time to be quiet, shape posture habits, and learn breathing awareness can help students to be mindful and have the tools to self-regulate (Johnson, 2002).

The Whole Child and the Space of the Classroom. The education system is reintroducing play, art, music, and movement into the school days after large amounts of research have proven the importance of these extra-curricular activities on developing the whole child (Hannaford, 1995). Movement, connection, touch, play, and creative endeavors have been proven to be critical components to teaching students to be well-rounded individuals of society (Hannaford, 1995). Humor, music, and movement work together to create and enhance student engagement and overall classroom experience (Strean, 2011). According to Strean (2011) humor

is not about telling jokes, but instead creating a light and stress-free environment where students are engaged and able to make mistakes as well as learn from them. In Strean's earlier studies, humor and interaction are discussed as one in the same. Music can energize students and create a positive feeling inside the classroom (Strean, 2011). According to Strean (2011), easy ways to incorporate music are playing it when students walk into the classroom, leave the classroom, or are working.

Incorporating movement in the classroom is a way to enhance class cohesion and create an environment that promotes laughter and fun (Strean, 2011). Hannaford (1995) states that movement improves learning, creativity, stress management, and health. Johnson (2002) questions what it might be like to be able to move more freely in a classroom space, to stand, walk around, sit in different configurations, or talk with classmates. Classrooms have always tended to have desks and chairs facing the front and a limited amount of movement, noise and discussion (Johnson, 2002). Although various research has been and is being done to go against this way of learning, the change has been slow to become practice. Johnson's (2002) idea to create a productive and stress-free classroom environment is to interrupt the familiar structure by sitting in a new place, incorporating short periods of silence with sensory awareness, incorporate group movements, or inviting students to change their seat in the room while in the middle of working. Creating or changing the classroom layout with extra thought on furniture arrangement, lighting, temperature, air circulation, and outside noise is a crucial component to creating a classroom environment that promotes learning (Johnson, 2002).

Healthy Body, Healthy Mind

The balance between new and old teaching practices can often be hard to juggle for teachers. When creating a more body-friendly academic classroom that incorporates movement,

choice, play, and natural expression you can help students to develop themselves as a whole (Johnson, 2002). However, when students go off to other classes and assume the teaching style will be the same, they are often seen as disruptive, rude, and must change their ways to fit into an old practice of teaching and education (Johnson, 2002).

The idea that to have a healthy mind does not require a healthy body is thought to be true across a large portion of the education system (Johnson, 2002). Preschool educators and theorists tend to have a different way of thinking and practicing. Many preschool educators believe in the crucial role of the body in learning, which can be seen through their teaching of playful and imaginative movements, flexibility, and sensory enrichment (Johnson, 2002). Experiments and individual discovery is encouraged and holds a place of importance, but formal academic content begins to take precedence over a whole-child or mind-body learning approach when students reach kindergarten and grade school (Johnson, 2002). The overall goal is to be more effective in learning and be more aware and active in the learning process, the question is, how do we achieve that throughout all grade levels (Johnson, 2002).

Crossing the Midline

Oftentimes parents and teachers are quick to diagnose a student and look for prescription medications to help solve problems that look like ADHD when in reality they could just be fixed through midline movements in and outside of the classroom (Biles, 2014). Students are often constrained in schools with the need to line up in rows, sit at a desk, or move in a specific way (Gintis, 2007). Having this narrow set of options for movement throughout the day has been shown to overly influence our consciousness (Gintis, 2007). Allowing children to be apart of the decision and choice process is a valuable learning experience for them to be able to develop fine-tuned self-care skills (Gintis, 2007). When having children make important choices, adults need

to be patient and take the time to communicate information to help guide them to their final choice for it to have a positive effect (Gintis, 2007).

Developing Bodies

Students go through important developmental stages as they grow that build on one another (Biles, 2014 and Mackinder, 2010). Infants need to spend enough time on the floor rolling, creeping, and crawling to develop the muscles in their abdomen, hip flexors, shoulders, and arms; these muscles help them to stand, sit, and do normal everyday movements (Biles, 2014). These movements also help to develop their Vestibular Apparatus, or the inner ear mechanism that is used for balance (Biles, 2014). The Vestibular Apparatus tells the frontal lobe to produce acetylcholine, which helps with attention span, memory, and concentration (Biles, 2014). Human beings use three things to help them balance: tactile or touch, their Vestibular Apparatus, and their eyes (Biles, 2014). If a child's Vestibular Apparatus is not fully developed, they must rely on other factors to help them balance or overcompensate in other ways which makes it much harder for students to succeed in the classroom (Biles, 2014).

A student without a fully developed Vestibular Apparatus may show signs such as being a poor reader while sitting, squirming, having poor handwriting, reversing letters or numbers, having a short memory or low attention span, unable to sit on the floor, or unable to stand on one foot correctly for fifteen seconds (Biles, 2014). Many of these signs of a poorly functioning Vestibular Apparatus are the same as the symptoms of ADHD, which makes it difficult to tell the difference (Biles, 2014). Biles' book (2014) is full of resources and activities that can help children to develop their Vestibular Apparatus. These activities include: crawling, wheelbarrow walks, spinning, hanging upside down, swinging, crab walking, forward rolls, somersaults, log rolls, etc. (Biles, 2014 and Gintis, 2007). Balance and other skills gained through these specific

movements are necessary to understanding how to read and learn in a classroom. A few examples of skills needed to be a student in a classroom and perform well include: being able to sit on the carpet, keeping your hands to yourself,, listening to someone give you instructions, and sit properly in a chair. If a student is unable to balance they will have trouble keeping their hands to themselves, not falling out of their chairs, and being able to follow directions in the classroom. Balance is the first skill children need in a classroom before they are able to be fully ready to learn and become a student.

Midlines and Planes

Every individual has three midlines: the right-left midline or sagittal plane, the front-back midline or coronal plane, and the top-bottom half midline or axial plane (Hyatt, 2007). Each midline is important to help in your coordination of different activities and abilities to do different things. Laterality is the coordination between the right and left hemispheres of the brain, which helps with reading, writing, listening, speaking, and the ability to move and think at the same time (Hyatt, 2007). The coordination of movement to opposite sides of the body, such as touching the hand to the opposite foot, requires a transfer of information between the left and right hemispheres of the brain through the corpus callous (McClelland, et al., 2015). The corpus callous is a network of nerve fibers, which join the left and right brain hemispheres and play an important role in reading (McClelland, et al., 2015). Normal vision and word recognition requires an equal division of labor between the left and right hemispheres (Shillcock, & McDonald, 2005). The right hemisphere of the brain receives what the left visual field is picking up and the left hemisphere of the brain receives what the right visual field is picking up (Shillcock, & McDonald, 2005). Simple tasks can be performed effectively when just one hemisphere is directly projected but the brain performs complex tasks more effectively when

both hemispheres are able to work together and share the labor (Shillcock, & McDonald, 2005). Focusing is the coordination between the front and back portion of the brain and it helps with comprehension, and is the section of the brain that would be responsible for a person having attention deficit or hyperactivity disorder (Hyatt, 2007). Centering is the coordination of the top and bottom halves of the brain and it helps balance rational, thoughts, and emotions (Hyatt, 2007).

Every child is born with a midline barrier (Biles, 2007). Having this midline barrier prevents an individual's eyes from smoothly moving across the body (Biles, 2014). Through natural daily physical activities children should be able to track smoothly by the age of seven, eliminating the midline barrier (Biles, 2014). Not all children reach the daily amount of physical activity to eliminate this midline barrier making it difficult for them later in life to read and perform other academic and physical activities with ease (Biles, 2014). Biles (2007) discusses that if the midline is still present after the age of seven, a child's eyes "will consistently jump or flutter back and forth while tracking" (p. 6). Biles (2007) mentions that this movement will make it difficult for students to "systematically decode letters, syllables, or whole words" (p. 6). Babies and children often move in ways that we associate with animals such as playing leap-frog or pretending to be sea creatures or reptiles (Gintis, 2007). Once a person has learned a movement a few times the brain remembers what to do and they no longer need to think to execute the movement (Gintis, 2007). These are a few of the examples of ways in which children break down that midline barrier.

When a certain midline is not fully developed early on, students will have a hard time with specific activities in the classroom such as reading or tracking items across their body or may compensate by using other strategies (Mackinder, 2010). Difficulty crossing the body's

midline to manipulate objects will draw attention to this midline imbalance (Stilwell, 1987). An easy way to determine if a child has a midline deficit is to hold an object in front of their eyes and have them track it without moving their head from side to side or without their eyes fluttering back and forth or jumping away from the object when it approaches their midline (Biles, 2014). Biles's (2014) shares activities that help to develop a child's midline, such as finger painting, stringing beads, rolling out cookie dough, playing Jenga, cutting with scissors, stacking building blocks, or rolling clay in their hands. Cross lateral movements, to activate both hemispheres of the brain, help children learn to enjoy learning (Hannaford, 1995). While performing these activities it is extremely important that the child completes them directly in front of their bodies without moving their head in either direction (Biles, 2014).

The importance of breaking down a child's midline is extremely important for their reading and overall success in the classroom as students. This is something that can not be ignored any longer by the education system. Physical education and midline movements are an essential and important part of an overall child's academics and ability to learn.

Conclusion

There are various ways in which physical movements are being incorporated in classrooms across grade levels. Specifically, midline movements are shown to promote neurological repatterning and facilitate whole-brain learning (Hyatt, 2007). Exercises that enhance the three different midlines have been shown to improve reading, writing, listening, comprehension, and balancing of emotion skills (Hyatt, 2007). Although simple tasks can be administered when the midline and both hemispheres of the brain are not fully developed, it has been found that more complex tasks can be performed more effectively when both hemispheres are working together and the midline has been fully developed (Shillcock & McDonald, 2005).

Purpose of This Study

The purpose of this study is to explore how midline movements affect how students feel in their bodies, as well as students' focus and ability to learn in the classroom. Midline movements can provide physical exercise that also supports student learning across all subject areas. The research will look at how incorporating midline movements into a kindergarten classroom will affect how students feel in their bodies and how those feelings affect their behaviors in the classroom throughout the day. The research will also look at the IPM, and how it incorporates midline movements in a school setting.

Chapter 3: Methods

Multiple research studies indicate that movement exercises can improve a student's focus and that particular attention to midline movement practices can further enhance a student's capacity for learning (Biles, 2014). Underdevelopment of midline balance has also been shown as being correlative to students overcompensating with disruptive classroom behaviors (Mackinder, 2010). Specifically, midline movements are shown to promote neurological repatterning and facilitate whole-brain learning (Hyatt, 2007). There are three midlines that have been identified and exercises that enhance these midlines have been shown to improve reading, writing, listening, comprehension, and balancing of emotion skills (Hyatt, 2007).

Little research has been done to directly look at how midline movements completed inside the classroom affect kindergarten students and how they feel in their bodies, their ability to focus and learn throughout the day, and their overall behavior following midline movement activities in the morning. Therefore, more data is needed to better comprehend students' behaviors following midline movements and their thoughts on how it affects them.

The following methods were designed by the researcher who considered ways in which students could be engaged in midline movements for a short amount of time while not taking away from the academics in a classroom. The researcher also designed the methods so that students could be engaged in the process of determining their thoughts and feelings in their own bodies following these movements. In this study, the voice of the students was seen as the direct authority and primary source of data on the subject.

Research Questions

This study had two foci: 1. student responses to questions presented in a longitudinal qualitative data collection study and 2. professional educator responses to interview questions for ease of implementation and breadth of substantive data. To this end, the student questions and professional educator interview questions were formed based on the following central questions:

How do students feel in their bodies after completing midline movement activities?

How does completing midline movements in the morning affect student behaviors in the classroom throughout the day?

How do midline movement activities affect a student's focus and ability to learn in the classroom?

These central questions were used to focus the study around how midline movement activities affect students and how they can be beneficial to students in various ways. These central questions are all focused on kindergarten students and how these midline movements affect them physically, emotionally, and mentally. The central idea is to determine how students feel about these midline movements as well as what teachers see in their student's behaviors following the activities.

Research Approach

The research engaged in sequenced and longitudinal qualitative data collection with a phenomenological approach and from a pragmatic worldview. A lack of student brain development and focus in the classroom is the reason students are overcompensating in other ways or being incorrectly diagnosed or labelled (Mackinder, 2010). Teachers are searching for ways in which to help their students focus in the classroom to keep up with the high academic standards and demands. Creswell (2018) notes that the pragmatic worldview is focused on

solving real world problems in a practical way that is appropriate to the context without needing to conform to any pre-existing theories.

The researcher conducted a study using a longitudinal qualitative approach to look at how midline exercises and movements affect how a student feels and behaves in the classroom following such movements. Creswell (2018) discusses how qualitative researchers ask open-ended questions and collect data and then interpret, validate, and reveal the potential outcomes of the study. Qualitative research involves collecting data through interviews and informal observations of the participants. A longitudinal approach was chosen for this study in order to gain a better understanding of the effects midline movements have on students over a longer period of time and to improve the quality of data triangulation. It was phenomenological in nature, in that it invited students to provide the nuances and insights of their own lived experiences. The researcher further collected data through interviews of professional teachers as well as informal observations of my students following the midline movements. The researcher observed and collected data in the setting of the participants (Creswell, 2018). The researcher chose this sample of participants because the findings of working with kindergarten students would benefit their everyday teaching. The researcher chose this sample of interview participants because the three professional educators had first-hand experience and observations with midline movements and its effects on students in the classroom.

This study aims to demonstrate to teachers ways in which midline movements can be incorporated into their teaching in simple ways that do not take away from their teaching and academic minutes. Student participants have an opportunity to enhance their midline and brain development to help them have more control over their bodies and their actions while also

learning new vocabulary and ways to describe how they are feeling in their own body and what different movements can be used to help regulate those feelings.

The rationale for a pragmatic, phenomenologically qualitative approach was to provide the scope of data to code the nuances of subjective lived experiences toward identifying possible solutions for student's focus and their ability to learn in the classroom.

Research Design

Research Site and Entry into the Field

The students all attended River Elementary School where the researcher served as their classroom teacher. River Elementary School is located in a middle class neighborhood. Two-thirds of the population lives in the neighborhood and one-third of the population are students from out of district. The student population is approximately fifty percent Caucasian, thirty percent Latino, twenty-seven percent Asian, and three percent African-American.

In addition, three professional educators at Valley Elementary School were recruited to participate in individual interviews. Valley Elementary School is where the participant did her student teaching and is in the same small school district.

Participants and Sampling Procedure

Participants in this student study were all minors, aged five to six. The student sample included a diverse population of 23 students from the researchers kindergarten classroom. The researcher sent a consent letter home to the parents of all students that outlined the purpose of the study and provided details on how the data was going to be collected and protected. Students who returned the signed parental consent form were able to participate in the study. For this reason, the study relied on a convenience population sample based on the individuals who signed

the parental consent form. For this study, this type of sample was desirable because the classroom was a group of kindergarteners who are the age needed for the study.

In addition, three interviews took place to include the founder of IPM, the principal who brought the program to Valley Elementary School, and a classroom teacher at that school site who piloted the program and associated equipment. The three professional educators who were specifically chosen were contacted personally about being interviewed for the study. Each individual was given a consent letter that outlined the purpose of the study and provided details on how the data was going to be collected and protected.

Methods

Student participants experienced a sequence of alternating days in which they participated in documented movement activities and days in which they did not. This went on for a total of three rounds alternating between days in which students participated in the movement activities and days in which students did not participate in the movement activities. On the days in which they participated in the movement activities, they went through a series of movements that focused on enhancing their midline for approximately five to ten minutes. Prior to the start of the study, students in the classroom created a workout video that incorporated midline movements and letter sounds. This video was part of the midline activities used.

Students were asked questions (See Appendix B), following the movements, or on control days after they had proceeded with other standard (non-movement focused) school activities. Students were not asked all of the questions each day, but instead were asked a few questions as a whole group and then invited to write down their answer and draw a picture to match one of the questions. The student questions were intentionally created and designed for the purpose of generating responses that provided findings for each of the research questions. The

questions asked students about how they felt in their bodies and asked them to describe what they were feeling before and after the midline movements. For example, one question asked, "Can you tell me a word to describe how you are feeling in your body?" Students were also asked to write a sentence and draw a picture to match the feelings they were describing during and after participating in the movements. Other questions were asked to search for ways to help students arrive at the feelings and results we are looking to solve. For example, "What would help you to pay attention better?" and "What would help you to feel calmer in your body?" Asking these questions in a group setting allowed participants to get other ideas on how they might be feeling if they were unable to describe it themselves, as well as in the individual setting it allowed participants to elaborate on more experiences that were specific to them. Students wrote their initials on the back of the paper. Students then turned in their paper and explained their drawing to the researcher. It was expected that the questions and the process of writing and drawing a picture to match would take no more than approximately fifteen minutes. Students turned in their work individually and shared their drawings with the teacher individually. Papers were stored in a locked cabinet where only the researcher had access.

Professional educators who participated in the interviews were asked various questions about midline movements and the IPM program they use at their school site (see Appendix C). The interviews occurred at Valley Elementary School. The interviews took place in December 2019 and January 2020 and each lasted approximately forty-five minutes. Participants were asked to describe their interest and involvement in the IPM program and midline movement activities as well as a brief break down of the program and movements. Participants were then asked open-ended questions about midline movements and activities in general and how they have seen them benefit students first hand. For example, one question asked, "What are the

benefits that you see in your students in the classroom after participating in the program?" Another question asked, "Do the benefits help students in various age groups differently? Participants were also asked to reflect on this program and what they have seen with their students with questions such as, " Do you see any negatives to students participating in this program? or "Is there room for growth with this program? If yes, how?" Finally, participants were asked to reflect on how further research could be done and how teachers could assist in bringing these movements into their classrooms each day. Each interview was recorded on the researcher's phone which is password protected. Notes were taken during each interview. No written information included any names or identifying information unless consent was given.

Data Analysis

The data was collected with a phenomenological approach using a triangulating qualitative data and sequenced longitudinal qualitative data collection design. Qualitative data analysis methods were used to analyze the student answers as well as the professional teacher interview responses. All discussions and interviews were audio recorded and completely transcribed by the researcher. The researcher wrote analytic memos directly after the discussions to capture data about the group interactions and individual body language.

The transcribed discussions and interviews were open coded by hand by identifying both expected and unexpected codes in the data. While traditional qualitative research has no variables being tested, a triangulating qualitative data approach with phenomenological considerations allowed the researcher to code qualitative data through interpretive analysis. This initial coding process began by segmenting the text data by identifying key words, phrases, and ideas. Concept mapping was utilized for further exploration of the data by sorting the codes into

categories to search for association, conflicts, or gaps in the data. Themes emerged through the analysis of the concept map and written reflections on the findings.

After concept mapping, the qualitative codes were input into spreadsheets to organize the data and expedite pattern searching. The researcher wrote descriptions of the characteristics and contexts of the themes identified to clarify their relevance to the research questions. During the additional analysis of the data, the researcher searched for information to develop a description of the participants' experiences to examine any commonalities among how the students were feeling and how the teachers perceived their student's feelings and actions following midline movement activities.

Validity and Reliability

As a working professional who has taught students aged kindergarten through second Grade, the researcher has an influence on the learning success of her students. The researcher is a professional educator who has built rapport and community with the students and professional teachers participating in the study. The researcher has experienced collaboration in her many roles as an educator in the classroom with her students as well as outside of the classroom with her colleagues. The researcher used peer debriefing with a colleague in the education field to involve interpretation beyond the researcher to enhance validity of findings and research methods (Creswell, 202). The researcher also used triangulation to determine the different positions or points of view there may be in the research. The researcher searched for discrepant evidence by incorporating days in which the movements were used and days in which they were not. Rich data was uncovered through a long term involvement with the same group of students in the study. When interviewing the professional teachers and gathering qualitative research, respondent validation was used by the researcher to improve the accuracy, credibility, and

validity of the study. During the process of conducting the study, the researcher worked to remove all personal bias, to the extent possible. As a former division-one athlete, the researcher believes that physical education and movement can benefit students, not only in their physical abilities but also in other aspects of their lives.

Chapter 4: Findings

In investigating if and how midline movements completed in a kindergarten classroom affect a students' feelings and behaviors, several themes emerged. A few of the primary themes that emerged were how midline movements helped students feel calm and gain self-awareness, a sense of interpersonal awareness and finally, a situational or classroom awareness. The main theme that was consistent throughout interviews with educational professionals and student writing entries and behaviors was how movements directed at a student's midline can help them feel calm in their bodies and show behaviors that support this calm feeling in the classroom. This study looks at how students feel in their bodies on days following midline movements or days in which no midline movements were administered to look for any change or difference. Students were directed to write a sentence and draw a picture of themselves describing how they feel in their bodies throughout the study. The data presented assumes that colors such as blue or purple represent a feeling of being calm, still, or quiet. It also assumes that colors such as red or orange represent a feeling of being crazy, silly, or loud. The information below uses "blue term" to describe words a student would use to describe their feelings as being calm. A "red term" is used to describe words a student would use to describe their feelings of being not calm, silly, or other similar words. The research completed through data collection from students, observations of students, and interviews of professionals in the education field helped to shine light on the many benefits of midline movements in elementary school classrooms.

Calmness and Self-Awareness

After completing the research, 86% of students used "blue terms," such as still, quiet, and peaceful, to describe how they were feeling in their body on the days in which the midline

movements were completed. On these days, 94% of students' drawings featured mostly blue color tones.

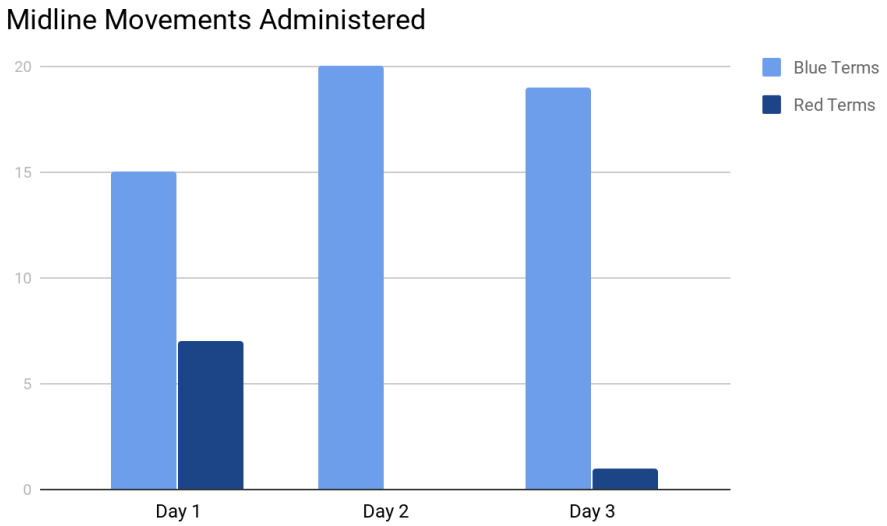

Figure 1 Blue and Red Terms Used Following Midline Movements

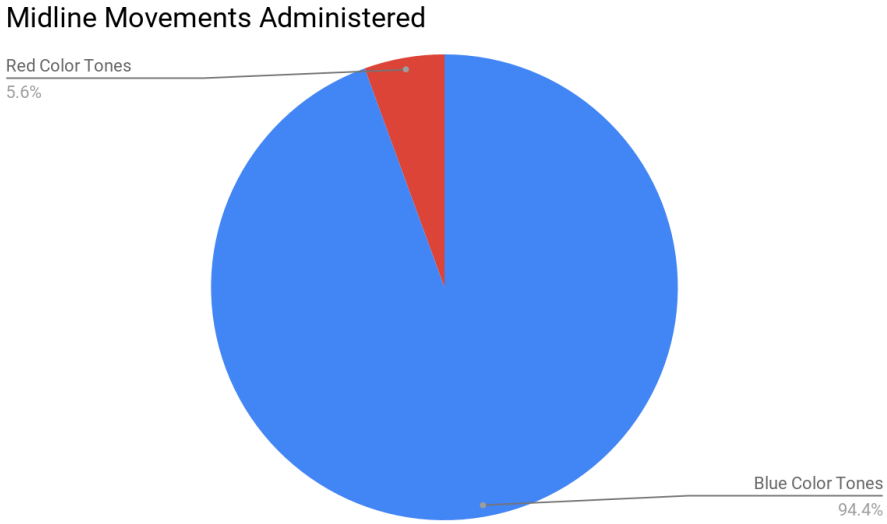

Figure 2 Blue and Red Color Tones Used Following Midline Movements

It was discovered that 41% of the students used blue terms to describe how they were feeling no matter if they completed the midline movements that day or not. Ten out of twelve girls, or 83%, used all or almost all blue terms to describe how they were feeling each day regardless of whether midline movements were completed.

Excluding the students who always answered using blue terms, 63% of students used “red terms,” such as loud, crazy, and silly, to describe how they were feeling in their body on the days that no movement was completed. On these days, 58% of students’ drawings featured mostly red color tones.

The data shows the correlation between positive feelings in students to achieve success in the classroom when midline movements are performed and negative feelings in students that do not help achieve success in the classroom when movements are not administered. This means that the baseline for students using blue terms is at 41% on control days and 86% on days in which midline movements were completed. This also means that the baseline for students using blue color tones in their drawings is at 42% on control days and rises to 94% on days in which midline movements are completed. The data shows a large increase in students using blue terms and color tones in their drawings to show how they feel in their body due to these movements that cross their midline.

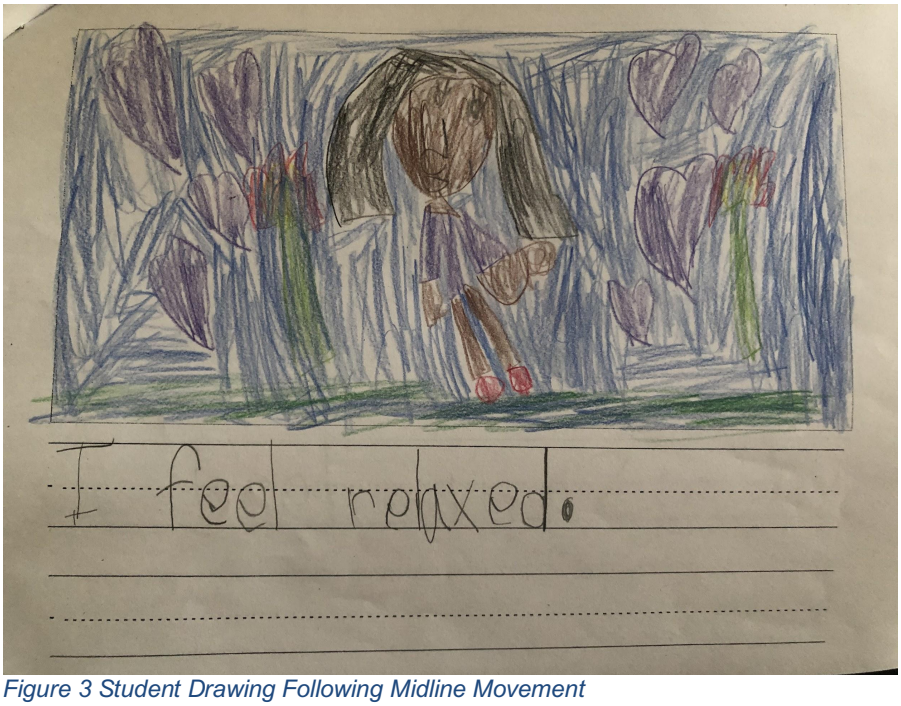

Figure 3 Student Drawing Following Midline Movement

Figure 4 Student Drawing Following No Midline Movement

Noise level

It was discovered that after days in which midline movements were administered students were much quieter throughout the day as well as at the end of the day during free choice time. Not only were their voices quieter, but the overall sound that they were creating with their choice of play decreased as well. One of the things tracked through field notes that I found surprising was that on days when the students did not practice the midline exercises I would go home with a headache, but on days when the students did practice the exercises I had no headache symptoms. I believe this data correlates with the student data found throughout the research. On days in which students were feeling calmer in their bodies I was able to feel calmer in my body as well.

Following the rules

On the days that midline movements were administered, students were more consistent in following the classroom rules. Students walked out to recess, lunch, and around the campus without needing my direction or reminders. Throughout the day students tattled far less on each

other compared to days in which no midline movements were conducted as well. Student F is one of my most challenging students. Through the duration of this study her behavior has completely changed. She was no longer falling asleep at the table, not completing her work, making sounds and talking throughout the day, or having problems with her peers. Since the start of the study all of her writing entries included blue terms when discussing how she felt in her body, no matter whether midline movements were completed that day or not. During the study she was the first to come into the classroom and sit quietly on the carpet, was not having problems with her peers, and was always following directions. This was a complete change in behavior for her that was noticed by many adults around her. As the study came to a close I kept my eye on Student F to see if this new behavior was permanent or just temporary. Since the study has ended her behavior has reverted back to how it was before the study began. Since ending the study, on days when I have asked her about how she feels she will use red words, such as crazy and silly, to describe how she is feeling in her body. The consistency of the midline movements during the study seemed to have a positive effect on her behavior in the classroom during that time period.

Pervasive Calmness Amongst the Students

Overall there seemed to be a calmness over the classroom on days in which the movements were completed. Students seemed relaxed and able to focus on the tasks at hand without getting distracted or having an overwhelming amount of energy that they could not contain.

On top of the data collected from the students in the classroom, data was also collected through interviews of three professionals in education. Interviewee E is an elementary school teacher in the same district that the students in the study went to. Interviewee E has been

teaching for twenty years and became interested in the subject of midline movements when she realized her students were having difficulties retaining information and transferring it across the midline of their body from one page to the next and tracking words in the middle of a book. She noticed students who jumped around often, had a hard time sitting still in their chairs, and read quietly because they were struggling with reading. Interviewee E determined that she needed to do something about it and decided to ask her principal to bring a midline movement program to their school and test it out. After testing out the program and incorporating other midline movements in her daily classroom routine she stated that she saw less fidgeting, distractibility, and an overall calmness over her students after completing midline movements. She stated that, "After working on midline movements for a consistent time period my students seem to be calmer and able to focus on what I am asking them to do rather than being distracted or focusing on other things around them." She was specific in describing her students' energy level to be calm but not tired after completing midline movements. Interviewee E stated, "After thirty minutes of midline movements my students are mentally and physically exhausted." She talked about how the activities are not just to tire their bodies out but are actually mentally tough as well. Interviewee E stated, "You can see immediately that they (the students) are thinking about the movements and their brain is working to make their body move." She also noticed that students were able to make more eye contact with her and sit in their chairs longer after consistently completing midline movements throughout the week.

Pervasive Calmness Extending to Teachers

As expected, performing midline movements helped students to have more self-awareness and assisted them in feeling calm in their bodies. What was not expected was to feel calmness over myself, as the teacher. At the end of each day I do a short journal entry to jot

down how the day went, how I felt, what lessons went well or did not, and anything that I feel is of importance. At the end of the study I went back to my journal notes and coded my thoughts using a blue and red marker to distinguish between the thoughts I had written down. After coding, I went back and wrote what days correlated with the days in which the midline movements were completed and the days in which they were not. The coding unexpectedly revealed to me that on days in which midline movements were completed my journal notes were mostly blue and on days in which midline movements were not completed my notes were mostly red. At the end of each day that the midline movements were administered I went home feeling calm, energized, and stress-free. On these days I also noted that I felt like students learned, followed directions, and used their energy in a positive way. On days in which midline movements were completed my journal notes were light and did not include any student names for behavior problems.

On days in which no midline movements were completed my journal notes had a list of students who I had talked with throughout the day about keeping their hands to themselves or not being kind to their classmates. On these days I went home feeling stressed out, tired of talking, and overall on edge. The days in which no movements were completed I felt as though I was putting out small fires throughout the entire day with students. I was constantly pulling students aside to talk about their behavior and mending relationships with students and their peers. There is a small group of girls that often have friendship problems during our free choice or activity time at the end of the day. Each of the days that midline movements were not administered I had written about their friendship problems in my notes, whereas on days in which midline movements occurred their names were not written. The connection to how my students felt in their bodies on these days and then how their behavior impacted my day was overwhelming.

Body and Interpersonal Awareness

Through the research, it was discovered that students also gain a better sense of body and interpersonal awareness. Students are shown to be able to sit still or in their chairs for a longer period of time through the integration of midline movements. They are also able to show more awareness in their bodies through being able to keep their hands to themselves and not invade other student's personal space. Each of the three experts in the education field that were interviewed discussed how students had a greater body or physical awareness after performing midline movements in the classroom. Interviewee E stated that midline movements affect students differently depending on their age and whether or not they have had previous exposure to gymnastics, tumbling, or other midline crossing movements before beginning this type of work in the classroom. She states that, "Students in different age groups perform midline movements in a different way and also are affected by completing midline movements differently as well." She discussed that due to this, students who have had previous exposure will most likely not show as much growth as students who have not. Interviewee H states that, "Many kids are not doing these things (midline movements) so we get to see a lot of growth in both younger and upper grades when they first start." She talks about how, "You might actually see a more drastic change in the upper grade students over the younger students because they mainly flop around in class anyways so you might not be able to see the growth as much."

Stability

In my interviews of professionals in the education field and observations in my own classroom, I found that students often will wrap their leg around the leg of their chair to ground themselves. I also found that students would sit in their chairs sideways or tilt their body a specific way to balance or prop themselves up. In my review of the pre-existing research I found

that oftentimes students whose midline was not yet fully developed would unknowingly do this to help stabilize themselves so they do not fall out of their chairs (Biles, 2014). In my own classroom, students would often fall out of their chairs or fall to the ground throughout the school day. As expected, after starting my research with midline movements in the classroom, I saw the number of students falling out of their seats, or needing to stabilize themselves in some way, begin to go down. Before the study and midline practice, I had an average of ten students fall out of their chairs on a daily basis. After the study and midline practice, these numbers went down to an average of two students per day.

Interviewee S has completed research on midline movements and the barrier of the midline. He started his career as an elementary school physical education specialist and quickly became interested in researching the topic of the midline when asked to travel the world testing students and presenting the effects of a midline barrier on students in the classroom. His dissertation shows how participating in midline movements helps to improve student's test scores and "Make great strides in improving academics while improving their focus." Interviewee S discussed how after implementing midline movements with his students, "Some teachers stated that they noticed a decrease in the number of students that stand while doing classwork." He also discussed that "some (teachers) have stated that they have seen an increase in the students focus ability." Interviewee S went into detail about the shift in his findings throughout his career, he states that, "Although my initial research for my dissertation was on the midline barrier, since then, our results have been with individual students, showing more anecdotal evidence. The teachers are reporting that they witness less fidgeting, less standing up doing classwork and an increase in the students focus." These findings are similar to what was seen during this study as well. After completing the study I noticed Student M consistently

sitting at a table instead of standing at the back counter like he did previous to introducing the midline movements in the classroom.

Small Differences. The third professional in the education field that was interviewed was Interviewee R, a principal at an elementary school in the same district that the students in the study attend. She explained that when she was a teacher she had no training on physical fitness, midline movements, or on problems students were having in the classroom and ways in which she could help them. When she became a principal she was determined to help her teachers have the training she had not received and look into ways in which her school could better assist its students in these challenging areas. She decided to adopt and try out a midline movement program to see how it would affect the students at her school. After a few years of giving teachers access to this program she decided to talk to the teachers to see if they were seeing any benefits to their students from using the midline movement program. Interviewee R stated that the transitional kindergarten teacher at her school does midline movements with her students five days a week. She stated that, "The teacher has seen tremendous improvement in their body awareness, their ability to sit in class, as well as to keep their hands to themselves." She also noted that these observations might be hard for outsiders looking in to notice or observe. However, she stated that the teachers who are in the classroom each day have the ability to notice both the small and big differences that midline movements are making on their students. "If I walked into their classroom, I probably would not be able to see the differences that these midline movements have made on their students because I did not know them or their behaviors before. But my teachers are with these students every single day and can see if they are finally able to track while reading across the page or are able to keep their hands to themselves more during carpet time." She discussed how, "Since adopting the program and bringing awareness to

a student's midline I notice my teachers looking for signs of an undeveloped midline in their students and I see them doing kinesthetic midline movements out on the playground or for brain breaks." Interviewee R shared how she noticed students completing midline movements and activities throughout their day. Activities such as building in their Maker Lab, rolling play dough, or even spinning on the playground were all ways in which students were developing their midline without even knowing it.

Situational Awareness in the Classroom

Much of the findings, such as the self-awareness and ability for students to focus and sit still in the classroom, were generally expected, although still nuanced and informative. What was particularly surprising was the situational awareness and ability for students to have an understanding of their surroundings and what is happening in their environment. Situational awareness is the foundation for good decision making. From this, students are able to have a better understanding over how their actions affect the things in their surroundings. The following two examples support the data and the benefits of midline movements to students, teachers, and their classroom environment.

The Lego Story

At the end of each day students have free choice time where they have the option of choosing from a variety of toys, games, and crafts. Legos are particularly a popular choice with most of the boys in my class. Traditionally, at the end of free choice play, when it was time to clean up every single Lego in the classroom is left scattered on the ground. However, after having completed even just the first day of the midline movements, without even being prompted, there were no Legos left on the ground. Based on the protocol of the research, the following day we did not complete the midline movements, and I found that the Legos were left

scattered around the floor of the classroom. On the subsequent day, when the midline movements were once again completed, the Legos were not scattered on the floor. This pattern continued in the following weeks where the Legos were left a mess on days without midline movements and the Legos were picked up and the area was clean on days with midline movements.

Student J and Student M are the two students who spill the Legos on the ground during free choice every day. When taking a closer look, on day one of the study, Student M wrote that he was feeling still in his body after performing midline movements in the morning. In his drawing he used mostly blue and purple to draw himself and his surroundings. The following day, when no midline movements were featured, Student M wrote that he was feeling silly. In his drawing he used a rainbow of colors to draw himself.

On the first day of the study, Student J wrote that he was feeling loved and in his drawing he was wearing a yellow and green outfit while standing next to a bird and talking after performing midline movements in the morning. The following day, when no midline movements were featured, Student J wrote that he was feeling wild and drew a picture of himself wearing an orange and red outfit.

Throughout the rest of the study, both Student J and Student M were consistent in writing blue calming words for how they felt in their body on days in which they completed midline movements. On these days, Student J and Student M used words such as: still, calm, and loved to describe how they were feeling. On one of the movement days, Student M drew himself in all blue and had a background containing mostly blue and green. When he turned in his paper he stated that he was feeling “like a blue.” Student J drew a picture of himself wearing a light pink and yellow outfit standing outside with blue sky and green grass.

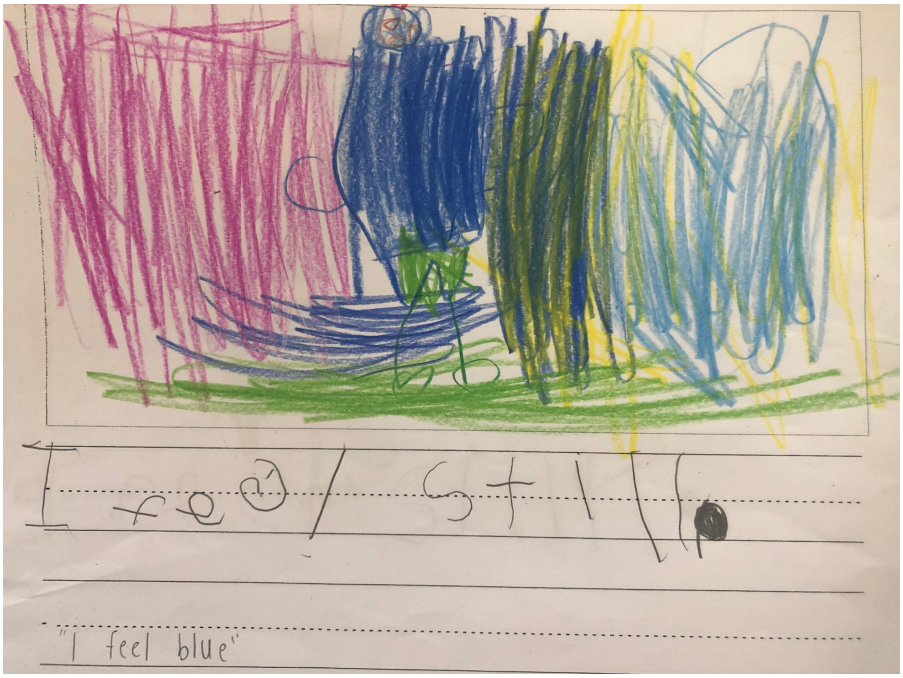

Figure 5 Student M: Following Midline Movement

Figure 6 Student J: Following Midline Movement

Throughout the rest of the study, both students were also consistent in writing red words for how they felt in their body on days in which they did not complete the midline movements. On the days in which no midline movements were completed, they used words such as: silly, loud, and wild to describe how they were feeling in their body. On one of the days without

movement, Student M drew a picture of himself outlined in red, the entire page shaded over with red, and a red heart to show how he was feeling. Student J wrote that he was feeling loud. In his drawing he was wearing a red shirt, there was a bright red and yellow sun, and he was yelling "mom" using all capital letters in a talking bubble.

Figure 7 Student M: No Midline Movements Administered

Figure 8 Student J: No Midline Movements Administered

These findings match up with the days in which the Legos were found cleaned up or left a mess. On the days that both Student J and M were feeling calm or still and using blue colors in their drawings, there was no mess left on the ground with the Legos. The opposite was also true, on the days that Student J and M were feeling silly or wild and using red in their drawings, there was a mess of Legos left on the ground.

The Crayon Story

Similar to the Legos, every day up to this point in the year, crayon and colored pencil containers would get spilt all over the tables and floor throughout the day. On the first day of completing the midline movements, there were far less crayons and coloring materials spilt or left on the tables and floor throughout the day to clean up. The custodian, who cleans my classroom every afternoon, came to me and told me how clean my floor was and how there were no smashed crayons underneath the chairs and wobble stools like usual. Based on the research protocol, the next day midline movements were not completed. At the end of the day crayons were once again spilt everywhere, left on the tables and floors, and smashed underneath the wobble stools. On day three, when the midline movements were completed, the crayons were not left on the ground or tables and the custodian once again reported to me that there were no smashed crayons underneath the wobble stools or chairs.

Student C is one of the students that is constantly spilling crayons and colored pencils on the tables and ground. On day one of the study, Student C wrote that he was feeling calm in his body following completing the midline movements. In his drawing he used mostly blue to color with and colored in his heart with purple. The following day, when no movements were completed, he wrote that he was feeling silly. In his drawing he used mostly red and orange, colored in his heart with red, and had a dark red zig-zag line coming out from his body. The

following week, when the midline movements were featured, he wrote once again that he was feeling calm. He drew a picture using different shades of blue, colored his heart in blue, and colored a tree next to him. The following day, when no midline movements were done, he drew himself mostly red, added a large orange sun in the sky, and colored in his heart orange.

Figure 9 Student C: Following Midline Movement

Figure 10 Student C: No Midline Movements Administered

Student D is also a student who consistently spills crayons and colored pencil bins on the tables and floor. On day one of the study when the midline movements were featured, Student D wrote that he was feeling calm. In his picture he used a lot of blue, green, and purple. The following day, when no movements were completed, he said that he was feeling tired. He drew a picture of him sleeping in a bed using a wide range of colors but specifically red, orange, and yellow around himself. On day five, when midline movements were completed, he wrote that he was feeling calm. He drew a picture using all blue and teal, his heart was also colored in blue. The following day, when no midline movements were done, his entire picture was colored in orange. He drew himself in all yellow and orange and yelling, shown through his use of all capital letters in his writing, inside of a talking bubble.

These findings match up with the days in which the crayons were found cleaned up or left a mess. On the days that both Student C and D used blue or blue tones in their drawings, were the same days that the custodian said the floor was cleaner than usual. The opposite was also true, on the days that Student C and D used red or red tones in their drawings, there was a mess of crayons left on the ground and the custodian did not comment on the cleanliness of the floors.

Conclusion

The data from this chapter indicates that incorporating midline movements into an elementary school classroom routine can benefit children's overall feeling in their body. The theme that was consistent throughout interviews with educational professionals and student writing entries and behaviors was how movements directed at a student's midline can help them to feel calm in their bodies and illustrate behaviors that support this calm feeling in the classroom. The findings of this study demonstrate a positive effect on the self-awareness, body awareness, and overall situational awareness of students in the classroom and their surroundings.

The available literature on midline movements to this point had not mentioned this type of finding, or benefits in this area. Since the discovery of this exploratory data, more research is needed in this area to demonstrate the ways in which midline movements can positively affect students in an elementary school classroom.

Chapter 5: Discussion

The findings of this study indicated that midline movements completed at the beginning of the day helped kindergarten students to not only gain self-awareness, but also a situational awareness. Students overall felt calmer in their body following midline movements. Their calmness and self-awareness was shown through the lowered noise level in the classroom as well as the pervasive calmness amongst the students that then extended to the teacher. There was also evidence to show students being able to control their bodies through body and interpersonal awareness. Students were able to sit for longer periods of time and control their bodies from falling out of chairs or needing to stand to do their work. Students gained a situational awareness in the classroom as they were able to keep their areas clean which aided in a more productive school day in which the teacher felt more calm as well.

The research literature has shown that midline movements can help strengthen a connection between the mind and body of students which results in a more productive and successful school day (McClelland et al., 2015). Other research has shown and corroborated a correlation between midline movements and the increase of academic abilities in students (Biles, 2014). This thesis views midline movements as a fairly new topic of research and looks to uncover ways in which further studies could build on these findings in other grade levels to show the positive effects in the classroom at all elementary level age groups.

Implications for Literature

Little research has been conducted on midline movements in elementary classrooms. While the findings of this research affirm the research presented in the literature review, such as students being able to sit longer, this research also further established that students overall felt

calmer on days that midline movements were administered developed greater situational awareness that resulted in a positive classroom environment for students to be successful and able to learn in. Taking into accont Strean's (2011) claim that,"all learning occurs in a mood and part of fostering student engagement includes attending to and maintaining the mood of the classroom" (p. 189), the findings of this research further demonstrate that administering midline movements with kindergarten students creates a calming environment in the classroom that fosters student learning. The findings in this research also found that through midline movements students affirm a body and interpersonal awareness that aids them in being able to sit still for longer periods of time, sit to do their work instead of stand, and have the stability to not fall out of their chairs as often. Students, based on the findings of this research, were also able to control their actions and take care of the space around them by cleaning up their materials after using them and not leaving a big mess and walking away.

Implications for Practice and Policy

Through this process I have learned the importance of movements that cross over an individual's midline and physical activity in general. The connection between the mind and the body is an essential part of education and needs to be on the forefront of how we educate our students. There are teachers who believe that teaching physical education and giving our students movement breaks are a waste of educational minutes. This study sheds light on the idea that not everything has to be pencil to paper for a student to learn valuable life skills and that teaching to the body is also teaching to the mind.

Based on the findings of this research, students would benefit from time set aside daily for this type of activity. The student participants (and the teacher) exhibited significant results with just five to ten minutes a day. Making midline movements a classroom routine or habit is an

evidenced-based way to help students to break down their midline barrier and succeed in the classroom both socially and academically. Students could benefit from a variety of movement designs and practices, including ones that cross their midline in the morning or as a brain break, outside or inside the school, and directed by school staff or through video-based guidance. Teachers have flexibility in how they decide to get their students moving and breaking down their midline barriers to help connect their mind and brain for success in the classroom.

This study has shown the importance of physical education on a child's learning development. It could impact how curriculum and programs are designed at the district and even state levels. School districts, specifically at the elementary school level, might put more emphasis on implementing a comprehensive physical education program and providing guidance and professional training for how teachers can incorporate midline movements and embodiment practices into regular classroom activities. It could also be beneficial to designate a portion of allocated physical education minutes to midline movements. Collectively, these practice and policy initiatives could support teachers in understanding the value and method for implementing the activities into their teaching, how to include midline movements particularly, and what they should look for when students are performing the activities.

These findings can contribute to altering the cultural values and norms of society regarding physical education and the introduction of movements that cross over the midline. Once there is light brought to the importance of midline movements I foresee there being an increase in parents sending their children to gymnastics and tumbling at a young age. I can also see more facilities, programs, and possibly even physical education curriculum being created targeting midline movements.

Limitations of the Study

Student Population

These findings were specific to kindergarten students in a middle-class population. The student population was demographically diverse, including multiple genders, racial identities, and socio-economic classes. However, the majority of students identify in school data as caucasian. These findings may or may not occur in a different grade level, class level, or population.

Age of Participants

One limitation on the study's findings was the test subjects were kindergarten students. The participants in this study provided a limited perspective because of their age. The students are all five to six years old with limited vocabulary and ability to articulate their feelings and emotions. Due to this, the information provided from them is open to a bit of interpretation. If they were further able to articulate how they were feeling and experiencing the effects of midline movements there would have been more detailed and specific data to show. For example, a few students wrote that they were tired both on days that midline movements were administered and were not administered. The problem with this is that feeling tired could mean a wide range of things. Students could be temporarily tired from moving around a lot, students could be tired with low energy due to sitting too long, or many other factors not explained through a simple description of feeling tired.

Time Limit

Another limitation to the study was that it was completed in a short period of time. If there was more time to conduct the study there could have been even clearer evidence to support

the findings, more concrete evidence collected, and a wider range of data to work with. At this student grade level, baseline vocabulary could be established earlier in the academic year through a variety of curricular windows allowing for a wider range of somatic and sensory understanding and communication. The classroom observational data proved to be an important component of the impacts of midline movements, and increased acuity toward the situational effects could advance the depth and breadth of knowledge on the topic. In this way, photos documentation of student behavior, classroom cleanliness, and other areas that were affected by administering midline movements would provide valuable information for analysis.

Other Perspectives

The study is also missing the perspectives of parents. The data from the study shows the change in student behavior at school but it would be interesting to see if parents also saw a change in behavior at home as well. It would be interesting to see if the same behavior pattern was seen following days in which midline movements were administered or not or if eventually the behavior would wear off and return to normal.

Future Research

There is a broad area available for future research on the effects of midline movements on students in elementary classrooms. Future research in this area might use similar methods to explore if different types of midline movements effect students in different ways. Future research might also examine how midline movements affect student's behavior changes based on gender. Future studies could also inquire into the affects midline movements have on students' abilities to learn specific academic concepts such as letter sounds or foundational math skills.

Conclusion

The research outlined in this study demonstrates the relationship between midline movements and the effects they have on student behaviors in the kindergarten classroom. This thesis has explained the importance of midline movements on student success, student behavior, as well as teacher well-being. Findings from twenty-two kindergarten students and three professional educators illustrated that the introduction of movements that cross over the midline are crucial to students feeling calm in their body and helping to create a calm classroom that supports learning and the well-being of everyone in it. The contribution of students in this thesis study showed that everyone has a voice and a way to benefit the education system and research. To forward the research and education of young students everywhere, this thesis proposes the creation and implementation of midline movement standards and curriculum for all students and schools. It is crucial that the research and data provided be shared with educators and law makers to set students up for success with a solid foundation while teaching to both their mind and body.

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Appendix A: IRB Approval Letter

DOMINICAN UNIVERSITY of CALIFORNIA

2/3/2020
Ashley Ludlow
50 Acacia Ave.
San Rafael, CA 94901
Dear Ashley,
On behalf of the Dominican University of California Institutional Review Board for the Protection of Human Participants, I am pleased to approve your proposal entitled *Midline Movement in Kindergarten* (IRBPHP IRB Application #10864).
In your final report or paper please indicate that your project was approved by the IRBPHP and indicate the identification number.
I wish you well in your very interesting research effort. Sincerely,
Randall Hall, Ph.D. Chair, IRBPHP
Cc: Matthew E. Davis, Ph.D.

[redacted]

Appendix B: Student Interview Questions

1. Can you tell me a word to describe how you are feeling in your body?
2. On a scale of 1-10, how calm do you feel?
3. What would help you to pay attention better?
4. What would help you to feel calmer in your body?
5. Can you draw a picture and write a sentence about how you feel while you are participating in the movements?
6. Can you draw a picture and write a sentence of how you feel after you are done participating in the movements?

Appendix C: Professional Educator Interview Questions

1. How did you get interested in researching midline activities and its benefits to students in the classroom?
2. How does the program work?
3. What are the benefits that you see if your students in the classroom after participating in the program?
4. Do the benefits help students in various age groups differently?
5. Do you see any negatives to students participating in this program?
6. Is there room for growth with this program? If yes, how?
7. Is there room for future research? If yes, what would you research?
8. How could teachers assist this program in their own classrooms?